REMARKS

Reconsideration and allowance of this application is respectfully requested in view of the discussion below.

Claims 1-3 and 9 have been rejected under 35 USC § 112, first paragraph, with respect to enablement concerning specific items indicated at Item 6 on pages 3 and 4 of the Patent Office Action.

Each of the three separate items indicated as lacking enablement in the Specification will be discussed in order.

The term "reduction of torque on the output shaft is compensated" is supported in the Specification in a manner to indicate that Claim 1 is implemented when shifting the gear, for example, in between the third and fifth gear. As shown in Fig. 15, when the shifting speed ratio at the first input shaft 23 is changed, the first friction clutch 25 is released and the dog clutch (9, 10 and 12) is switched from the first gear 35 to the fifth gear 39. Subsequently, the first friction clutch 25 is engaged to perform shifting. Thus, when the first friction clutch is released, the output torque of the engine 1 is not transmitted to the output shaft 27. As a result, there is a "reduction of the torque on the output shaft". According to the present invention, "reduction of the torque on the output shaft" is compensated by the second motor 30. When the torque is transmitted to the second input shaft 24 by the second motor 30 and the dog clutch (6, 7) is engaged with the second gear 33, the torque of the second input shaft 24 is transmitted to the output shaft 27 by means of the second speed gear train

(gears 33, 34). As a result, compensation of reduction of torque at the output shaft is possible. The details concerning the control method are in Fig. 17.

With respect to the term "torque fluctuation on the output shaft is suppressed" of Claim 2, this action occurs upon nominal shifting from the first speed to the second speed as shown in Fig. 11. At the first speed, the first friction clutch 25 is engaged and the second friction clutch 26 is released, and at the same time, the dog clutch (3, 4) is engaged with the first gear 31 and the dog clutch (6, 7) is engaged with the second gear 33. When shifting from the first gear to the second gear, the second friction clutch 26 is gradually engaged and the first friction clutch 25 is released as shown in Fig. 11. Subsequently, torque transmitted by the second friction clutch 26 is controlled in order to implement shifting (clutch to clutch shifting). At that time, inertia torque due to variation of revolution of the engine 1 is transmitted from the input shaft 24 to the output shaft 40 by means of the second gear train (33, 34). According to the present invention, torque fluctuation on the output shaft is suppressed by the second motor. Torque is transmitted to the second and third shaft 24 by the second motor 30. When the dog clutch (6, 7) is engaged with the second gear 33, the torque of the second input shaft is transmitted to the output shaft 27 by way of the second speed gear train (33, 34). It is therefore possible to suppress torque fluctuation with the detailed control method being shown in Fig. 12.

With respect to the term "the wear-out of said claw clutch is suppressed", applicants submit that upon shifting from the second speed to the third speed as shown in Fig. 14, the dog clutch (9, 10 and 12) must be engaged with the third

gear 35 before shifting. However, during travel at the second speed, the rotation speed of the first input shaft 23 corresponds to the rotation speed of the first speed. As a result, when the dog clutch (9, 10 and 12) is engaged with the third gear 35 after releasing the dog clutch (3, 4) from the first gear 31 (shown as c and d of Fig. 14), the rotational speed of the first input shaft 23 is abruptly changed to the rotational speed corresponding to the third gear (illustrated by a dotted line Ni1) to cause wear of synchronizer Z(10) of the dog clutch (9, 10 and 12). According to the present invention, in order to suppress wearing of the dog clutch, negative torque of the first motor 29 is transmitted to the first input shaft to restrict rotation of the input shaft 23 in order to reduce synchronization load on the synchronizer 10 whenever the dog clutch (9, 10 and 12) is engaged with the third gear 35. The detailed control method is illustrated in Fig. 14 with similar features being illustrated in Figs. 16, 18 and 24.

Therefore, applicants submit that Claims 1-3 and 9 and the accompanying Specification and drawings meet the requirements of 35 USC § 112, first paragraph, concerning an enabling disclosure.

Claims 1-3 and 9 have been rejected under 35 USC § 112, second paragraph, as being indefinite with respect to items indicated in Section 8 on pages 4 and 5 of the Patent Office Action. The above discussion clearly indicates that the claim structure provides a specific set of elements which perform a function in the manner supported by the Specification and the drawings as discussed above. Thus, Claims 1-3 and 9 are also in compliance with 35 USC § 112, second paragraph.

Claims 1-5 and 7-9 have been rejected under 35 USC § 102 as anticipated by Schnelle (WO 00/26053) for the reasons indicated at Item 10 on pages 5-8 of the Patent Office Action, and Claim 6 is rejected under 35 USC § 103 as unpatentable over Schnelle in view of U.S. Patent Application Publication No. 2002/0179347 to Tamai et al. It is to be noted that the reference to Schnelle has been indicated by the Examiner as an equivalent English version of the WO 00/26053 patent.

Applicants submit that the present invention, as defined by Claim 1, compensates for reduction of the torque on the output shaft when switching the dog clutch with one input shaft with the motor connected to another input shaft. The reference to Schnelle concerns hybrid transmissions but fails to disclose the feature that "reduction of torque in the output shaft is compensated" as defined by Claim 1.

Additionally, the reference to Schnelle fails to disclose that "torque fluctuation of the output shaft is suppressed." That is, according to the presently claimed invention defined by independent Claim 2, suppression of torque fluctuation of the clutch to clutch shifting is accomplished by switching the first friction clutch and the second friction clutch by the first and second motors, respectively.

With respect to Claim 9, there is a specific limitation related to "wear-out of the dog clutch is suppressed". That is, the present invention of Claim 9 relates to the synchronizer (synchronizing device) of the dog clutch and there is no such feature in the reference to Schnelle.

It must be also submitted that Schnelle fails to show the first friction clutch and the second friction clutch of the presently claimed invention, and as a result, Schnelle has a different construction which does not lead to the above claimed features in each of Claims 1, 2 and 9 which are not available from the reference to Schnelle.

Concerning the rejection of Claim 6, the reference to Tamai concerns a propulsion system for use in a hybrid vehicle but does not add anything toward meeting a claim limitation of independent Claim 6 with respect to the first and second friction clutch and their interrelationship.

In response to the objection to the Abstract, applicants are submitting herewith a new Abstract of the Disclosure containing the appropriate number of words.

Therefore, in view of the distinction features between the claimed invention and the references, which features are not shown or disclosed or made obvious by the references or their combination, and in view of the sufficiency of the claim structure to meet the requirements of 35 USC § 112, first and second paragraphs, applicants respectfully request that this application containing Claims 1-9 be allowed and be passed to issue.

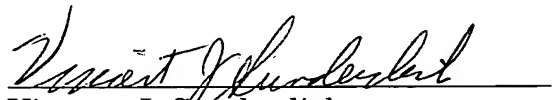
If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and

please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #381NP/50859).

Respectfully submitted,

October 20, 2003



Vincent J. Sunderdick
Registration No. 29,004
For James F. McKeown
Registration No. 25,406

CROWELL & MORING, LLP
P.O. Box 14300
Washington, DC 20044-4300
Telephone No.: (202) 624-2500
Facsimile No.: (202) 628-8844

JFM/VJS/acd
056207.50859US

ABSTRACT OF THE DISCLOSURE

In a power transmission apparatus for use in an automobile, including a gear-type transmission and plural numbers of motors, the gear-type transmission 100 ~~comprises:~~ includes a first input shaft 23, onto which the motive power is transmitted from an engine 1 through a first friction clutch 25 [;] , a second input shaft 24, onto which the motive power is transmitted from an engine 1 through a second friction clutch 26 [;] , and plural numbers of gear trains between the first input shaft 23 and an output shaft 27, and between the second input shaft 24 and the output shaft 27. ~~Onto the first input shaft 23 and the second input shaft 24 are connected a first motor 29 and a second motor 30, so that the motive power is transmitted from the above two (2) motors~~ Each input shaft ins connected to a separate motor whereby power is transmitted through the plural numbers of gear trains up to the output shaft 27 ~~. Therefore, it is possible to make the maximum torque of the motors small, which is~~ in order to minimize the maximum torque of the motor, as required when changing claw clutches provided on the gear trains.